CLAIMS

We Claim:

1. A method for monitoring a laser signal comprising:

(a) forwarding the laser signal to an etalon;

(b) detecting light transmitted through the etalon;

(c) detecting light reflected from the etalon; and,

(d) calculating a ratio from the detected light transmitted through the etalon and the light reflected from the etalon.

2. A method as in claim 1 wherein in (d) the ratio is equal to power of the light transmitted through the etalon divided by power of the light reflected from the etalon.

3. A method as in claim 1 wherein in (d) the ratio is equal to power of the light reflected from the etalon divided by power of the light transmitted through the etalon.

4. A method as in claim 1 wherein in (d) the ratio is represented below:

$$\frac{P_t[\lambda]}{P_r[\lambda]} = \frac{T}{R}\frac{1}{FSin^2\left[\frac{2\pi ndCos(\theta)}{\lambda}\right]}$$

where $P_t[\lambda]$ represents detected power of the light transmitted through the etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T represents transmittance of the etalon, R represents reflectance of the etalon, F is

a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of the etalon, d is a cavity length, θ is an angle at which an incident beam passes through the cavity, and λ is a wavelength of the laser signal.

5. A method as in claim 1 wherein in (d) the ratio is represented below:

$$\frac{P_r[\lambda]}{P_t[\lambda]} = \frac{R}{T} F Sin^2\left[\frac{2\pi n d Cos(\theta)}{\lambda}\right]$$

where $P_t[\lambda]$ represents detected power of the light transmitted through the etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T represents transmittance of the etalon, R represents reflectance of the etalon, F is a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of the etalon, d is a cavity length, θ is an angle at which an incident beam passes through the cavity, and λ is a wavelength of the laser signal.

6. A method as in claim 1 wherein the etalon is a Fabry-Perot etalon.

7. A system that monitors a laser signal, the system comprising:

an etalon that receives the laser signal;

a first detector that detects light transmitted through the etalon;

a second detector that detects light reflected from the etalon; and,

a monitor that calculates a ratio from the detected light transmitted through the etalon and the light reflected from the etalon.

8. A system as in claim 7 wherein in the ratio is equal to power of the light transmitted through the etalon divided by power of the light reflected from the etalon.

9. A system as in claim 7 wherein the ratio is equal to power of the light reflected from the etalon divided by power of the light transmitted through the etalon.

10. A system as in claim 7 wherein the ratio is represented below:

$$\frac{P_t[\lambda]}{P_r[\lambda]} = \frac{T}{R} \frac{1}{FSin^2\left[\frac{2\pi ndCos(\theta)}{\lambda}\right]}$$

where $P_t[\lambda]$ represents detected power of the light transmitted through the etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T represents transmittance of the etalon, R represents reflectance of the etalon, F is a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of the etalon, d is a cavity length, θ is an angle at which an incident beam passes through the cavity, and λ is a wavelength of the laser signal.

11. A system as in claim 7 wherein the ratio is represented below:

$$\frac{P_r[\lambda]}{P_t[\lambda]} = \frac{R}{T} FSin^2\left[\frac{2\pi ndCos(\theta)}{\lambda}\right]$$

where $P_t[\lambda]$ represents detected power of the light transmitted through the etalon, $P_r[\lambda]$ represents detected power of the light reflected from the etalon, T

represents transmittance of the etalon, R represents reflectance of the etalon, F is a coefficient of finesse of the etalon, n is an index of refraction inside a cavity of the etalon, d is a cavity length, θ is an angle at which an incident beam passes through the cavity, and λ is a wavelength of the laser signal.

12. A system as in claim 7 wherein the etalon is a Fabry-Perot etalon.

13. A system as in claim 7 wherein the system additionally comprises:

a reference device that receives the laser signal; and,

a detector that detects light transmitted through the reference device.

14. A system as in claim 13 wherein the reference device is a gas cell.

15. A system as in claim 13 wherein the monitor uses a ratio equal to power of the light transmitted through the etalon divided by power of the light reflected from the etalon to compare the etalon with the reference device.

16. A system as in claim 13 wherein the monitor uses a ratio equal to power of the light transmitted through the etalon divided by power of the light reflected from the etalon to compare the etalon with the reference device and the monitor uses a ratio equal to power of the light reflected from

the etalon divided by power of the light transmitted through the etalon to interpolate between peaks.

17. A system that monitors a laser signal, the system comprising:

a measurement means for receiving the laser signal;

a first detection means for detecting light transmitted through the measurement means;

a second detector means for detecting light reflected from the measurement means; and,

a device means for calculating a ratio from the detected light transmitted through the measurement means and the light reflected from the measurement means.

18. A system as in claim 17 wherein in the ratio is equal to power of the light transmitted through the measurement means divided by power of the light reflected from the measurement means.

19. A system as in claim 17 wherein the ratio is equal to power of the light reflected from the measurement means divided by power of the light transmitted through the measurement means.

20. A system as in claim 17 wherein the system additionally comprises:

reference means for receiving the laser signal; and,

a third detector means for detecting light transmitted through the reference device.